



02-10-03

02/1624  
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Kazuo NAKAMURA  
Application No. : 10/098,638  
Filed on : 03/15/2002  
For : Micromixing method for liquefied matter  
containing plural types of substance  
Group Art Unit : 1624  
Examiner : Venkataraman BALASUBRAMANIAN

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20231 on Febraury 5, 2003.

Kazuo NAKAMURA

( Name )

Kazuo Nakamura

( Signature )

Assistant Commissioner for Patents  
Washington, D.C. 20231

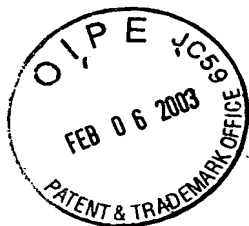
COMMUNICATION ( S ) AND AMENDMENT ( CORRECTION )

Sir :

In response to the Office Action of 08/06/2002 , I have enclosed  
amendment as follows :

Examples : 7 Pages

[Application example]



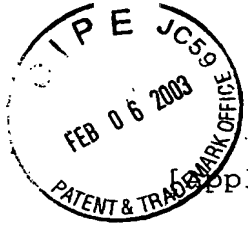
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The taste of alcoholic drinks did not become mellow by the permeation through sintered porous body such as sintered glass and sintered alumina.

On the other hand, the taste of alcoholic drinks became mellow by the permeation through phase separation porous glass. Especially it is remarkable that only 20% of mixed ratio of alcoholic drinks permeated through the phase separation porous glass (80% of original alcoholic drinks) achieved the same degree of mellowness with 100% of alcoholic drinks permeated through the phase separation porous glass (0% of original alcoholic drinks).

This result shows that the extremely effective micromixing between water and alcohol molecules caused the well mixed clusters of water and alcohol molecules.

The well mixed clusters are known to make the taste of alcoholic drinks mellow.



[Application example]

### Permeation method A

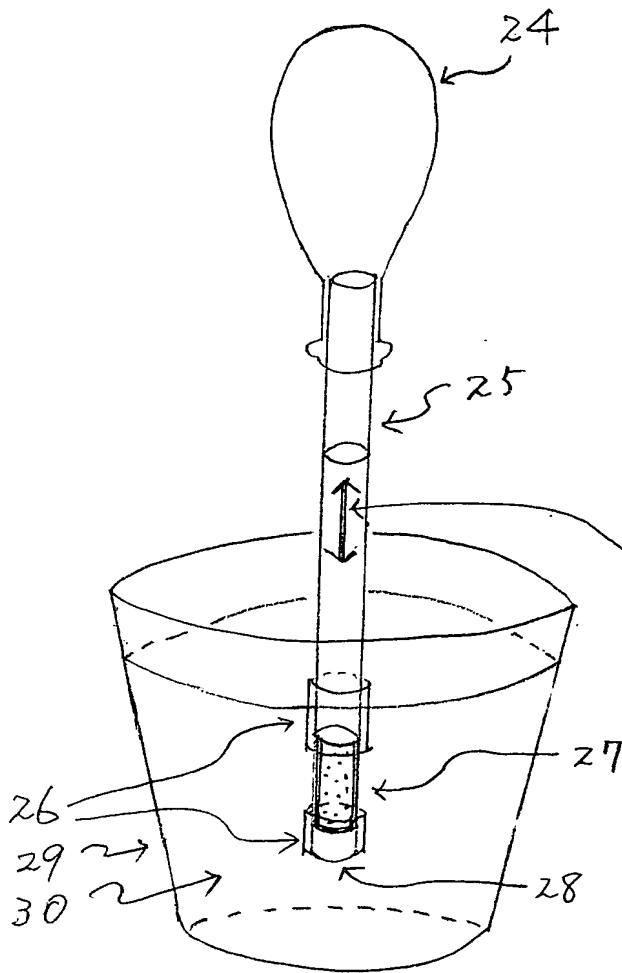
Liquefied matter containing plural types of substance is permeated through a porous body under suction and pressurization by silicon rubber.

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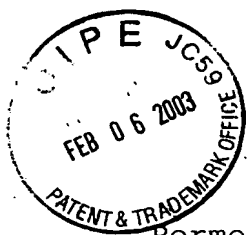
FIG.3

[Description of the numbered parts]

- 24 Silicon rubber
- 25 Pyrex glass tube
- 26 Heat shrink tube
- 27 Phase separation porous glass (Pore diameter : 10 micro meter)
- 28 Pyrex glass rod
- 29 Glass for alcoholic drinks
- 30 Alcoholic drinks



Alcoholic drinks flow upward and downward in the pyrex glass tube under suction and pressurization by silicon rubber.



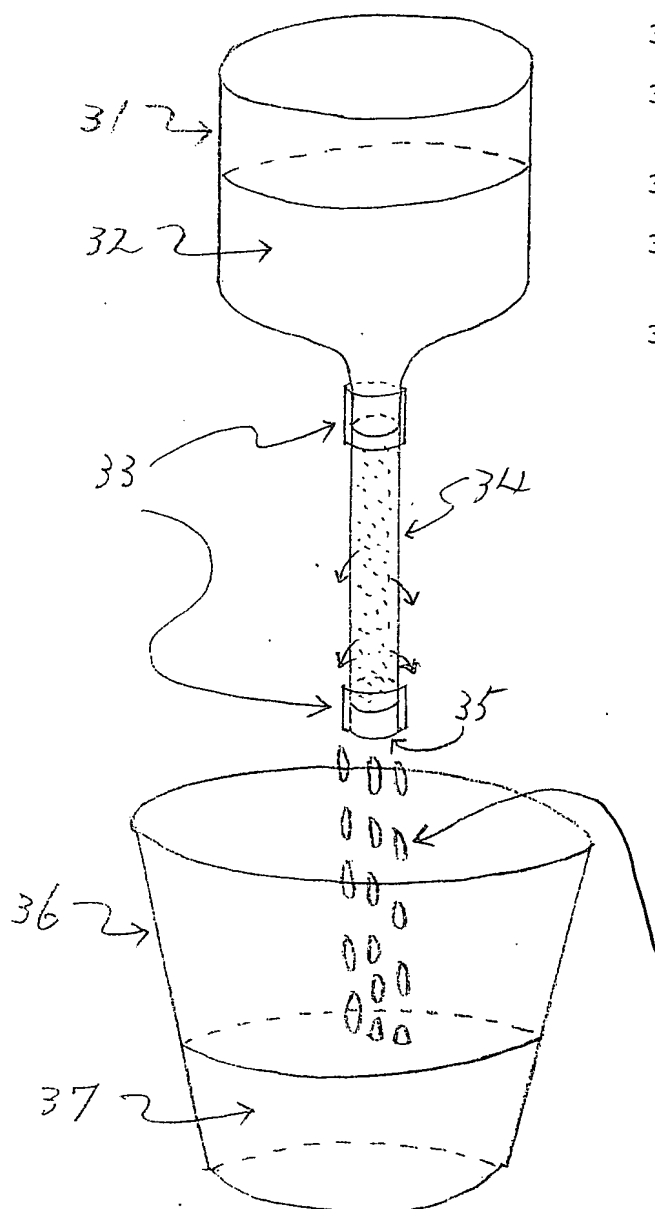
# Permeation method B

Liquefied matter containing plural types of substance is permeated through a porous body by gravitation.

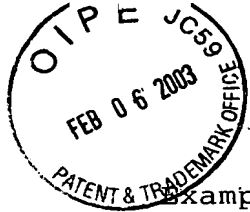
FIG.4

[Description by the numbered parts]

- 31 Pyrex glass vessel for original liquefied matter
- 32 Original liquefied matter before permeation
- 33 Heat shrink tube
- 34 Porous body (Pore diameter : 10 micro meter)
- 35 Pyrex glass rod
- 36 Glass vessel for liquefied matter after permeation
- 37 Liquefied matter after permeation



Liquefied matter permeates through porous body and pours into the glass vessel 36.



Example

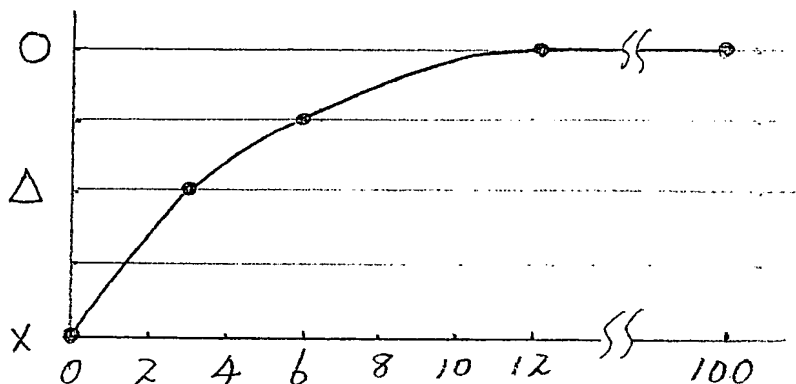
Italian wine ' Lagoblu ' (11%vol)  
Permeation method : A

Degree  
of  
Mellowness

Mellow

A little  
mellow

Not mellow



Mixed ratio of wine permeated  
through phase separation porous  
glass (%)

Example

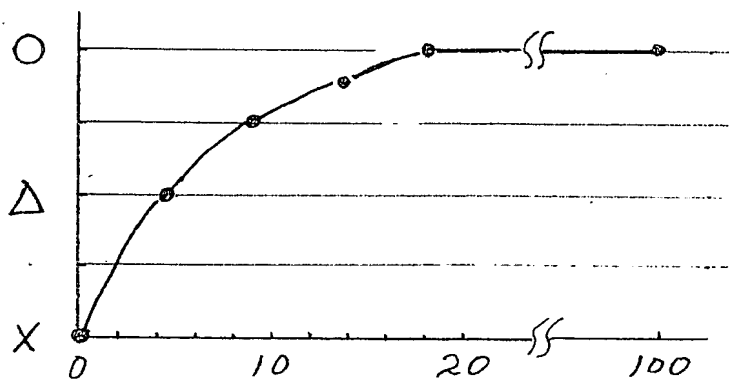
Whisky ' Black Nikka ' diluted with the same  
amount(wt) of water  
Permeation method : A

Degree  
of  
Mellowness

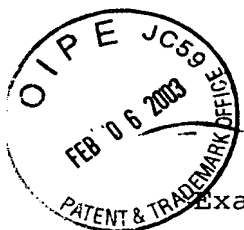
Mellow

A little  
mellow

Not mellow



Mixed ratio of whisky permeated  
through phase separation porous  
glass (%)

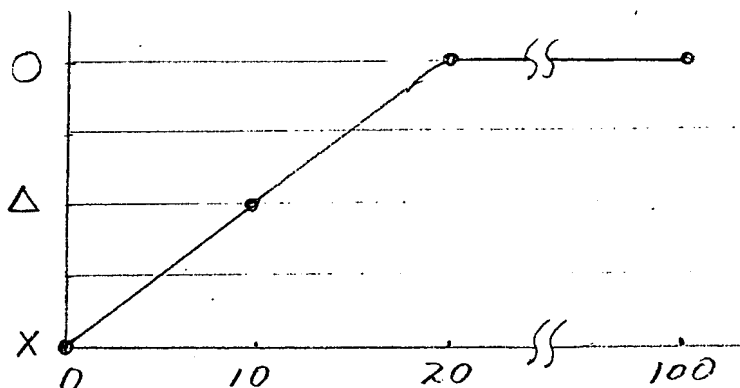


Example

Vinegar from grain ' Mitsukan-su ' diluted with the three times amount(wt.) of water

Permeation method : B

Degree of Mildness { Mild  
A little mild  
Not mild



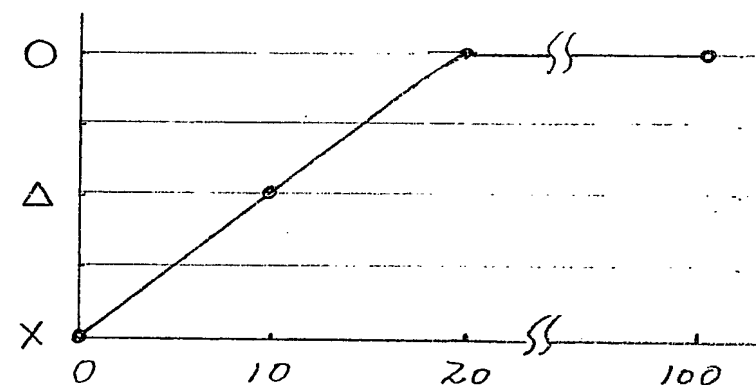
Mixed ratio of vinegar permeated through phase separation porous glass (%)

Example

Soy sauce 'Kikkoman' diluted with the five times amount(wt.) of water

Permeation method : B

Degree of Mildness { Mild  
A little mild  
Not mild



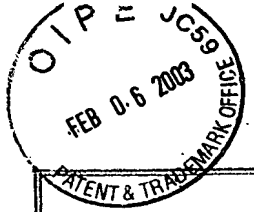
Mixed ratio of soy sauce permeated through phase separation porous glass (%)

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	Liquefied matter	Porous body	Permeation method	Mixed ratio of liquefied matter permeated through porous body	Evaluation of taste	
					Beginning	After 110 days
Comparison	Japanese "Sake" One Cup-Okazaki (15% Vol)	Sintered alumina (Pore dia. 10 $\mu$ m)	B	100% (0% of original liquefied matter)	X (not mellow)	X (not mellow)
		Sintered glass (Pore dia. 10 $\mu$ m)	B	100% (0% of original liquefied matter)	X (not mellow)	X (not mellow)
Example	Japanese "Sake" One Cup-Okazaki (15% Vol)	Phase separation porous glass (Pore dia. 10 $\mu$ m)	B	80% of original liquefied matter	O (mellow)	O (mellow)
			B	100% (0% of original liquefied matter)	O (mellow)	O (mellow)



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12/2003 CENTER 1600/2900		Liquefied matter		Porous body	Permeation method	Mixed ratio of liquefied matter permeated through porous body	Evaluation of taste	
Example	Italian Red wine 'Lagoblu' (11% Vol)	Phase separation porous glass (Pore dia. 10 $\mu$ m)	B	20% (80% of Original) (liquefied matter)	○ (mellow)	○ (mellow)	Beginning	After 110 days
	whisky 'Black Nickel'	Phase separation Porous glass (Pore dia. 10 $\mu$ m)	B	100% (0% of Original) (liquefied matter)	○ (mellow)	○ (mellow)		
			B	20%	○ (mellow)	○ (mellow)		
			B	100%	○ (mellow)	○ (mellow)		
	Brandy 'Suntory VO'		B	20%	○ (mellow)	○ (mellow)		
			B	100%	○ (mellow)	○ (mellow)		

